

REMARKS

This communication is a full and timely response to the Office Action dated November 12, 2008. Claims 1, 4-11, and 14-19 are pending. By this communication, claims 2, 3, 12, 13, and 20 are canceled without prejudice or disclaimer to the underlying subject matter, and claims 1 and 5 are amended. Support for the amended subject matter can be found, for example, on page 5, lines 21-23 of the disclosure.

In numbered paragraph 1 on page 2 of the Office Action, the Examiner alleges that Applicant has failed to provide a certified copy of the foreign priority documents. Applicants disagree.

The International Bureau received a certified copy of GB 0510317.1 on June 16, 2006, and EP 05270017.6 on June 22, 2006. The Examiner acknowledges receipt of the same in Section 12 of the Office Action Summary sheet. Under current PCT practice and procedures, "[t]he requirement in PCT Rule 17 for a certified copy of the foreign priority application is normally fulfilled by applicant providing a certified copy to the receiving Office or to the International Bureau or by applicant requesting the receiving Office to prepare and transmit the priority document to the International Bureau if the receiving Office issued the priority document." See MPEP §1893.03(c)(II). "The U.S. Patent and Trademark Office, as a Designated Office, will normally request the International Bureau to furnish the copy of the certified priority document upon receipt of applicant's submission under 35 U.S.C. 371 to enter the U.S. national phase. The copy from the International Bureau is placed in the U.S. national stage file. The copy of the priority document received from the International

Bureau with either of the indications above is acceptable to establish that applicant has filed a certified copy of the priority document." See Id.

In a "Notice of Acceptance of Application Under 35 U.S.C. 371 and 37 CFR 1.495" dated May 23, 2008 and issued in connection with the instant application, the USPTO acknowledged that the priority documents had been received. For at least these reasons, it appears that all priority documents have indeed been received in connection with the instant application. Applicant respectfully submits that it has followed all required procedures for submitting the priority documents and believes that at worst the Office can obtain these documents from the International Bureau. Although it appears that they have already been provided. As it stands, Applicant respectfully submits that the claim for foreign priority has been perfected.

In numbered paragraph 2 on page 2 of the Office Action, claim 1 was objected to for alleged informalities. Applicant respectfully traverses this objection. However, in an effort to expedite prosecution, claim 1 is amended to address the Examiner's concerns. Thus, withdrawal of this objection is respectfully requested.

In numbered paragraphs 4 and 5 beginning on page 3 of the Office Action, claims 1-6 and 9-20 are rejected under 35 U.S.C. §112, second paragraph, for alleged indefiniteness. Applicant respectfully traverses these rejections. However, in an effort to expedite prosecution Applicant's claims have been canceled without prejudice, thereby rendering these rejections moot. Withdrawal of these rejections, therefore, is respectfully requested.

In numbered paragraph 7 on page 4 of the Office Action, claims 1-12 and 20 are rejected under 35 U.S.C. §102(f) for allegedly not inventing the claimed subject matter. Applicant respectfully traverses this rejection.

As provided in the MPEP §2137, derivation requires complete conception by another and communication of that conception by any means to the party charged with derivation prior to any date on which it can be shown that the one charged with derivation possessed knowledge of the invention. *Kilbey v. Thiele*, 199 USPQ 290, 294 (Bd. Pat. Inter. 1978). See also *Price v. Symsek*, 988 F.2d 1187, 1190, 26 USPQ2d 1031, 1033 (Fed. Cir. 1993); *Hedgewick v. Akers*, 497 F.2d 905, 908, 182 USPQ 167, 169 (CCPA 1974). "Communication of a complete conception must be sufficient to enable one of ordinary skill in the art to construct and successfully operate the invention." *Hedgewick*, 497 F.2d at 908, 182 USPQ at 169. See also *Gambro Lundia AB v. Baxter Healthcare Corp.*, 110 F.3d 1573, 1577, 42 USPQ2d 1378, 1383 (Fed. Cir. 1997) (Issue in proving derivation is "whether the communication enabled one of ordinary skill in the art to make the patented invention.").

Applicant respectfully submits that the claimed invention cannot reasonably be considered as being derived from the 3M Radiant Mirror Film VM 2002 as the Examiner alleges.

In Applicant's disclosure, an exemplary thermal control film is described as follows:

The thermal control film according to a preferred embodiment of the present invention comprises a polymeric multi-layer structure comprising a set of interference filters designed and optimised to exhibit the desired optical characteristics as is illustrated in FIGS. 3 and 4. The film is required to have low absorbency of solar radiation, which includes part of the UV spectrum (200-400 nm), the visible spectrum (400-750 nm) and the near infrared spectrum (750-2500 nm). The film must also exhibit high absorbency and emissivity in the far infrared wavelength range (2.5 μ m to 50 μ m), that corresponds to the spectrum of heat generated by the high frequency circuits associated with the T/R modules of the antenna array. A further essential criteria is that the film exhibit a high transparency to the microwave frequencies, typically 1 to 30

GHz, used by communications and radar observation. Since the film is to be designed for use in space, the materials used should not only be capable of withstanding the temperature variations involved but also be able to maintain the optical characteristics required in such an extreme environment. Also since the bandwidths of the rejection bands are very high, the ratio of refractive indices between the materials used in the film should be as high as possible. Applicant's disclosure, paragraph bridging pages 8 and 9.

Applicant's disclosure also describes characteristics of the Radiant Mirror Film products from 3M. Particularly, these materials "comprise a multi-layer polymeric film with an outer protective layer of polyethylenenaphthalate to prevent degradation of the final optical properties through abrasion, moisture ingress or other environmental factors. The film is metal free and so will exhibit a high transparency to the microwave frequencies used by communications and radar equipment. In addition, the absence of metal is advantageous in that the film will not be susceptible to corrosion or electromagnetic interference that may affect operation of the antenna. The film material is thermally stable with a maximum continuous use temperature up to 125 C, and typically exhibits high reflectance over a (400-415) nm to (775-1020 nm) bandwidth with an angle of incidence range of 0 to 80. The film transmits wavelengths in the near infrared spectrum above 775-1020 nm and exhibits low absorbency above 400 nm (i.e., the visible and infrared spectrum). An additional coating can be applied to the film so as to achieve the desired lower absorbency in UV spectrum if desired." Id., page 9, lines 9-26.

Applicant further discloses that the exemplary thermal film is based on a commercially available material which is then adapted to achieve the desired optical characteristics, and a customized material can be manufactured to the precise specifications and obtained from certain suppliers. See Id., page 9, lines 27-32.

However, even considering this description, Applicant's invention cannot reasonably be considered a derivation.

The claimed invention lies in the identification and selection of desired characteristics of a thermal film to achieve a desired result. The 3M Radiant Mirror Film is an example of a known material that can be adapted to embody the characteristics necessary to achieve the desired result. As described at 3M.com, the mirror film "can be laminated to glass, polycarbonate, or other plastic lenses on handheld devices to provide a mirror look when the display is off, and an easy to read display when the display is on." See 3M.com, http://solutions.3m.com/wps/portal/3M/en_US/Manufacturing/Industry/Product-Catalog/Online-Catalog/?PC_7_RJH9U5230GE3E02LECFTDQGLE0_nid=JZXH48JNQ8gsSC2785KN7PgIH3SMK72MGNbl. For convenience, a copy of the relevant webpage at 3M.com is submitted herewith. A mirror film embodying these characteristics along with those described above cannot be used in an active spacecraft antenna application with a reasonable expectation of success.

Namely, while the mirror film of 3M, may exhibit some of the necessary characteristics it does not include the combined characteristics of having low absorbency of solar radiation, which includes part of the UV spectrum (200-400 nm), the visible spectrum (4000-750 nm) and the near infrared spectrum (750-2500 nm), exhibiting high absorbency and emissivity in the far infrared wavelength range (2.5 μm to 50 μm), exhibiting a high transparency to the microwave frequencies, typically 1 to 30 GHz, used by communications and radar observation, be capable of withstanding the temperature variations involved but also be able to maintain the

optical characteristics required in such an extreme environment, and have a high refractive indices ratio between the materials used in the film. Applicant's claimed thermal control film can be based on the 3M film technology but requires additional processing so that the multi-layer filters are tuned to encompass the desired properties. This additional processing creates a new product that is designed for use in space applications.

Based on the above, Applicant respectfully submits that the disclosure sets forth sufficient evidence of conception of the invention, such that the claimed invention cannot reasonably be considered to be derived from others. In arriving at conception [the inventor] may consider and adopt ideas and materials derived from many sources, [such as] a suggestion from an employee, or hired consultant so long as he maintains intellectual domination of the work of making the invention down to the successful testing, selecting or rejecting as he goes even if such suggestion [or material] proves to be the key that unlocks his problem. *Morse v. Porter*, 155 USPQ 280, 283 (Bd. Pat. Inter. 1965). See MPEP §2137.01(III). Based on the foregoing discussion, Applicant respectfully requests that the rejection under 35 U.S.C. §102(f) be withdrawn.

In numbered paragraph 8 on page 5 of the Office Action, claims 1-4, 6, 11-12, and 20 are rejected under 35 U.S.C. §102(b) for alleged anticipation by Lepore et al (U.S. Patent No. 5,373,305) and as further evidenced by the *Encyclopedia Britannica*. Applicant respectfully traverses this rejection.

Applicant's independent claim 1 recites the following:

An active spacecraft antenna metal free thermal control film comprising a multi-layer interference filter having alternating high and low refractive index layers, said control film exhibiting preselected high absorbency and emissive characteristics in the far infrared wavelength range 2.5µm to 50µm, low absorbency

characteristics in the solar spectrum range 200-2500nm and high transmissive characteristics in the microwave frequency spectrum 1 to 30GHz.

Contrary to the Examiner's assertion, *Lepore* fails to anticipate Applicant's claims. *Lepore* discloses an RF transparent thermal insulation blanket for an antenna reflector. The blanket uses an outer coating of germanium to reflect some of the solar spectrum. *Lepore* does not employ a multi-layer interference filter having alternating high and low refractive index layers. Moreover, the filter design of *Lepore* would not be suitable for use in an active antenna because of its characteristic of restricting heat passing into and out of the antenna reflector. Consequently, the design of *Lepore* would trap heat below the film leading to over-heating of the antenna. In contrast, an active antenna requires that the heat dissipated in the antenna is radiated to space.

Based on the foregoing discussion, the application of *Lepore* fails to establish a *prima facie* case of anticipation. To properly anticipate a claim, the document must disclose, explicitly or implicitly, each and every feature recited in the claim. See Verdegall Bros. v. Union Oil Co. of Calif., 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Because *Lepore* fails to meet this judicial standard, withdrawal of this rejection is respectfully requested.

In numbered paragraph 9 on page 7 of the Office Action, claims 1-2, 4, 6-7, and 12 are rejected under 35 U.S.C. §102(b) for alleged anticipation by *Iacovangelo et al* (U.S. Patent No. 6,587,263). Applicant respectfully traverses this rejection.

Iacovangelo fails to disclose every element recited in independent claim 1. *Iacovangelo* discloses multi-layer filter that includes a solar reflective layer in the form of a metallic coating typically made of silver or aluminum (col. 6, ll. 1-3).

Because the described filter includes a metallic layer, it does not allow for the transmission of RF signals and thus is not suitable for use in a spacecraft antenna application. Accordingly, *Iacovangelo* fails to anticipate claim 1 as alleged and withdrawal of this rejection is respectfully requested.

In numbered paragraph 12 on page 9 of the Office Action, Claims 1-4, 6, 11-12, and 20 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Lepore et al in view of "3M Radiant Mirror Film VM2000F1A6". Applicant respectfully traverses this rejection.

As described above, *Lepore* discloses an RF transparent thermal insulation blanket for an antenna reflector. The blanket uses an outer coating of germanium to reflect some of the solar spectrum. *Lepore* does not employ a multi-layer interference filter having alternating high and low refractive index layers. Moreover, the filter design of *Lepore* would not be suitable for use in an active antenna because of its characteristic of restricting heat passing into and out of the antenna reflector.

The Examiner alleges that the 3M Radiant Mirror Film VM2000F1A6 is combinable with *Lepore* to achieve Applicant's claimed result. However, even assuming *arguendo* that these documents are combinable, the resulting structure still would not meet the features recited in Applicant's claims. Namely, the 3M film is designed for use on the display of handheld devices to provide a mirror look when the display is off, and an easy to read display when the display is on. See 3M.com, http://solutions.3m.com/wps/portal/3M/en_US/Manufacturing/Industry/Product-Catalog/Online-Catalog/?PC_7_RJH9U5230GE3E02LECFTDQGLE0_nid=JZXH48JNQ8gsSC2785KN7PgIH3SMK72MGNbl. Thus, the known 3M film is not suitable for use in an

active spacecraft antenna application. Furthermore, none of the applied references describe a manner in which the 3M film could be adapted or modified for an active spacecraft antenna application as claimed.

The Examiner alleges that Applicant acknowledges that at the time of the invention one of ordinary skill could have produced films of this type. Applicant disagrees and refutes this assertion. one of ordinary skill, such as 3M, would not have had the requisite knowledge or understanding to produce a thermal film as recited in claim 1 without having first reviewed the examples and guidance provided in Applicant's disclosure.

In summary, *Lepore* and the known 3M film when applied individually or collectively, as alleged by the Examiner, fail to disclose or suggest every element recited in Applicant's claims. For at least this reason and those discussed in detail above, a *prima facie* case of obviousness has not been established.

To establish *prima facie* obviousness of a claimed invention, all of the claim limitations must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). Moreover, obviousness "cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination." ACS Hosp. Sys. V. Montefiore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). Based on the foregoing discussion, Applicant respectfully requests that this rejection be withdrawn.

Claims 7 and 9-10 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Lepore* in view of *Iacovangelo*, and claim 8 is rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over *Lepore* in view of *Iacovangelo*

and *Fischell* (U.S. Patent No. 3,671,286). Applicant respectfully traverses these rejections.

Because these claims variously depend either directly or indirectly from independent claim 1, Applicant respectfully submits that they are allowable for at least the same reasons discussed in detail above. Moreover, these claims are further distinguishable over the applied references because of the additional features recited therein, respectively. *Lepore*, *Iacovangelo*, and *Fischell* documents when applied individually or collectively fail to disclose or suggest at least the features recited in claim 1. Therefore, Applicant respectfully submits that a *prima facie* case of obviousness has not been established. Thus, withdrawal of these rejections is respectfully requested.

CONCLUSION


Based on the foregoing amendments and remarks Applicant has addressed all rejections, objections, and any other outstanding issues raised by the Examiner. In the event any additional concerns regarding the patentability of the claims remain, the Examiner is encouraged to contact Applicant's representative identified below.

Respectfully submitted,

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